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ABSTRACT

The effect of month of birth on skill development in language, reading, and mathematics was examined separately for kindergarten and first grade children. The study looked at the strength of the relationship at the beginning and end of the school year and as a function of the type of program in which the child was enrolled. One hundred and thirty-nine kindergarten children and 79 first graders participated in the study. Approximately half of the kindergarten children (N=69) were enrolled in a half-day traditional program while the others were enrolled in a full-day academic-oriented program. Measures administered at the beginning of the year included a language and mathematics test from the CIRCUS series and the Auditory Test from the Metropolitan Readiness Test. At the end of the school year, all the subjects were given the Reading, Language and Mathematics Tests from the Metropolitan Achievement Test. Results indicated a small but statistically significant relationship between month of birth and skill level at the beginning of kindergarten. At the end of the year, only the performance on the mathematics test was correlated to age for the kindergarten children and there was no relationship for first graders. Type of program did not alter the pattern of results. (Author/MP)

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Do Older Kindergartners Have an Advantage: The Importance of Month of Birth When Starting School

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Background of Study

Conventional wisdom among kindergarten teachers holds that the month of birth in which an entering five-year-old was born has a substantial impact on how that child will function in the classroom. The "older five-year-olds" are considered to be more mature and to have acquired more skills. This belief has an empirical and theoretical backing in developmental psychology where countless studies have demonstrated the overwhelming importance of age as a variable related to improved performance on a wide range of tasks. The present study examined the relationship between skill level and month of birth. The questions addressed in this study arose in conjunction with a research project designed to identify criteria for allowing five-year-olds to enter first grade. "Age" was continually suggested by teachers and parents as a criterion which should be incorporated into the policy.

Donofrio (1977) put forth a number of characteristics of the typical pre-mature school entrant likely to have problems; one of these was a July to December birthday. Miller and Norris (1967) found significant differences between early (5-8 to 5-11) and normal (6-0 to 6-7) entrants to first grade on three of six readiness measures. Differences favored the older entrants. However, there were not significant differences between these groups at the end of four years. The researchers felt the lack of differences was due to the effectiveness of the individualized reading program. A study looking at early-late differences at first, fourth and eight grade was conducted by Davis et al. (1980) using state-wide testing data for Kentucky. They found that the older first graders scored significantly higher than the younger first graders in total achievement, reading, language and math. This same pattern was found for the fourth graders but not for eighth graders. DiPasquale et al. (1980) analyzed psychological referrals with respect to the age at which the child entered first grade and found significantly more referrals for the children born in the last four months of the year. This effect was seen only for children between kindergarten and Grade 3 and not for older children. Furthermore, the effect was evident for males but not for females.

There clearly is evidence in the literature to suggest that the youngest children in an entering class may be at somewhat of a disadvantage. Most of the studies have focused on the first grade. The present study examined the importance of month of birth by looking at test scores from the beginning and end of the year for a group of kindergarten and first grade students. The impact of sex and quantity of preschool experience on the "birthdate effect," as DiPasquale et al. called it, was also examined. The kindergarten children were enrolled in two very different programs, a half-day traditional program and an all-day academic program, and thus the effect of program on the continued existence of a birth month advantage could be studied.

The questions addressed were:

1. Is month of birth related to language and mathematics skill development for five-year-olds when they enter school?

2. Is the relationship between skill level and month of birth affected by the quantity of preschool experience? Does the relationship hold for boys and girls?

3. If month of birth does have an effect on language and mathematics skills at the beginning of the year, does that relationship still hold

   - after a year of half-day kindergarten?
   - after a year of academically oriented all-day kindergarten?
   - at the beginning of first grade?
   - at the end of first grade?

Perspective

The study data are presented and interpreted from a framework of cognitive developmental psychology. Development of new skills is assumed to progress in a sequenced and orderly fashion. The acquisition of particular skill depends on a combination of the child's level of development and the experience the child's environment has provided. The principle environment examined in the study is the classroom. By presenting each child with a similar set of experiences, the school has the potential to offset, within a limited age range, the effect of maturation and the child's individual experiences. Much remains to be learned about how this process operates.

Method

Five- and six-year-old children were tested at the beginning and end of the school year. There were 139 kindergarten children and 79 first graders who were drawn from two kindergarten classes and one first grade at each of three schools. Approximately half of the kindergarten children (N=69) were enrolled in a half-day program while the others (N=70) were enrolled in a full-day academically-oriented program.

Measures administered at the beginning of the year included a language and mathematics test from the CIRCUS series (Listen to the Story, How Much and How Many) and the Auditory Test from the Metropolitan Readiness Test. In May of the school year, all kindergarten and first grade children in the study were given the Reading, Language and Mathematics Tests from the Metropolitan Achievement Test.

Additional information was available about the children in the full-day kindergarten who were the focus of the larger study. At the beginning and end of the year, teachers rated these children in reading, mathematics, general academics skills, and social emotional development. Information about amount and type of preschool experience was obtained from the children's parents.

Results

Two analytic approaches were used to examine the relationship between skill level as measured by the results on the standardized tests and month of birth. In the first approach, Pearson product-moment correlations were calculated between the child's score on the different assessment measures and age in months. Separate correlations were computed for the two groups of kindergarten children and the first graders. The correlations coefficients are shown in Table 1.

Table 1

CORRELATIONS FOR ASSESSMENT SCORES WITH MONTH OF BIRTH

	Kindergarten			Grade 1
	Half Day (n=69)	All Day (n=70)	Combined (n=139)	(n=77)
Beginning year				
CIRCUS-How Much and How Many	.33**	.23*	.31***	.19*
CIRCUS-Listen to the Story	.18	.36***	.29***	.21*
Auditory-Metropolitan Readiness	.08	.23*	.19*	-.01
End of Year	(n= 53)	(n=69)	(n=122)	(n=77)
Metropolitan Achievement Test				
Reading	.07	.06	.11	.09
Mathematics	.36**	.28*	.31***	.04
Language	.11	.14	.16*	.13

* $p < .05$
** $p < .01$
*** $p < .001$

Test scores were significantly correlated with age for the kindergarten children at the beginning of the year but the relationship was not particularly strong (r's of .2 and .3). These were also significant for the first graders for two of the three tests. Although the magnitude of the correlations found for the first graders was smaller, they were not significantly different from the correlations found for the kindergarten children.

Fewer significant correlations were found for both groups of kindergarten children at the end of the year. The Mathematics Achievement Test was the notable exception; results on this test correlated .31 with age in months for all kindergartens combined. Type of kindergarten program appeared to have no effect on the relationship between achievement and month of birth. The first graders' scores showed no correlation with any of the tests although again the correlation coefficients for the first graders did not differ significantly from those for the kindergarten children.

A second test of the relationship was conducted by dividing the students into age groups and comparing the mean scores for the extreme groups. The results of this analysis are shown in Table 2. The direction of the differences are summarized in Table 3. The pattern of results is rather sporadic with some significant differences for the younger age group and none for the first graders at the end of the year. However, as Table 3 shows, the direction of differences in every single comparison favored the older children. It seems reasonable that there is a pattern here which would have shown itself statistically with a larger sample.

Table 2

Comparisons of Means for Age Extremes

	Half Day Kindergarten			All Day Kindergarten			Grade 1		
	60 Months or less (n=19)	66 Months or less (n=15)	p	60 Months or less (n=18)	66 Months or less (n=27)	p	72 Months or less (n=16)	79 Months or less (n=21)	p
Beginning of Year									
CIRCUS-Listen to the Story	17.4	21.4	n.s.	22.2	28.0	.004	25.4	29.9	.04
CIRCUS-How Much and How Many	21.4	30.4	.03	32.0	37.9	n.s.	40.6	45.4	n.s.
Metropolitan Aud.	9.4	11.5	n.s.	12.2	16.9	.04	20.0	20.7	n.s.
End of Year									
Metropolitan Ach. Reading	3.5	4.4	n.s.	20.3	24.4	n.s.	32.1	38.1	n.s.
Math	10.7	14.4	.01	16.4	19.8	.04	25.9	27.3	n.s.
Language	14.9	16.2	n.s.	22.4	25.7	n.s.	28.8	31.6	n.s.

Table 3

DIRECTION OF DIFFERENCE FOR
COMPARISONS BETWEEN AGE EXTREMES

	Half-Day Kindergarten	All Day Kindergarten	First Grade
Beginning of Year			
Listen to the Story	+, n.s.	+, $p < .004$	+, $p < .04$
How Much and How Many	+, $p < .03$	+, n.s.	+, n.s.
Met. Readiness-Auditory	+, n.s.	+, p .04	+, n.s.
End of Year			
Metropolitan Achievement			
Reading	+, n.s.	+, n.s.	+, n.s.
Mathematics	+, $p < .01$	+, $p < .04$	+, n.s.
Language Arts	+, n.s.	+, n.s.	+, n.s.

+ = older group scored higher
- = younger group scored higher
n.s. = not statistically significant

Correlation coefficients were also computed for the rating scale completed by teachers of the all day kindergarten children. These results are shown in Table 4. The pattern is similar to that seen with the standardized tests: a small but statistically significant relationship at the beginning of the year with less of a relationship at the end of the year.

The examination of the impact of sex and amount of preschool experience on the relationship between skill level and month of birth revealed no effect for these variables.

Table 4

Correlations for Teacher Ratings
With Month of Birth

	Beginning of the Year	End of the Year
Reading/Language	.21*	.15
Mathematics	.31**	.10
General Academic	.18	.04
Social	.17	.11

Note: (n=70) Only all day kindergaten students were included.

* $p < .05$
** $p < .01$

Discussion

The results of this study confirm earlier studies which found a relationship between month of birth and skill level. This study further clarifies this relationship by demonstrating that the relationship exists at the very beginning of kindergarten for five-year-olds. It is not sufficient explanation for the relationship to say older children achieve more in school; in fact, they come to school knowing more.

Having said that, one needs to raise the question of educational significance of such a finding. Something as seemingly unimportant as the month of birth takes on special significance because it is used by school systems in determining when a child will enter school. The repercussions of being born in January when the school requires a child to be five years old by December are concrete and easily recognized. While it is true a relationship exists, the magnitude is small. Age explains only a small fraction of the variation between children entering school. The evidence does not appear to be strong

enough to suggest that birth month alone should be used as a criterion for allowing a child to enter kindergarten early or for holding children back. The results also suggest that the use of an administrative but arbitrary cut-off for school entrance does not appear to be grouping children detrimentally.

The existence of a relationship between month of birth and skill level early in children's school careers and its subsequent disappearance later suggests that the early school years act as an "equalizer." The readiness skills of the preschool years are supplemented by other skills such as reading and mathematics. These more sophisticated skills while requiring a general level of development are cultural tools and, therefore, not as likely to be sensitive to an age difference of several months. Also, as children get older, each new month contributes proportionately less to their total bank of experiences, six months for a one-year-old is 50 percent of that child's life; six months for a five-year-old is only ten percent. It is therefore reasonable that month of birth would become progressively less important as an explanation for variation between young students. Additional study of the process of early skill acquisition in school settings can contribute greatly to our understanding of the interplay between environment and maturation.

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